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SICK-STEGMANN Motor Feedback Systems
Assembly Instructions

⚠ Safety Notes

- ▶ Observe the professional safety regulations and accident prevention regulations applicable to your country.
- ▶ Switch off the voltage for all devices/machines and systems affected by the assembly.
- ▶ Impacts and shocks to the shaft MUST be avoided, as this may lead to damage to the ball bearings.
- ▶ Use suitable flexible shaft couplings. The suitability of the coupling depends on the occurring angle and shaft offset, acceleration, temperature, speed and bearing load permitted for the motor feedback system, as stipulated by the motor feedback system datasheet.
- ▶ Never make or undo electrical connections to the motor feedback system when voltage is applied, otherwise this may result in damage to the devices.
- ▶ Never pull or press the motor feedback system housing of the versions for integration.
- ▶ Do not bring rubber housings into contact with adhesive (e. g. Loctite 241, 243) since the dimethacrylate ester, which it contains, dissolves the surface.

Tools/Parts Required

Fixing the motor feedback system requires M4 screws and M3 screws, resp., depending on the encoder version. The length as well as the screw head type will depend on the fitting conditions.
For motor feedback systems with plug-in shaft, we recommend that a suitable pressing tool and removal tool, resp., be made.

Preparation for Attachment

Remove protective foil (versions for integration), if present, on the back of the motor feedback system.
Degrease the drive shaft and the shaft of the motor feedback system.
For motor feedback systems with plug-in shaft, use liquid thread locking compound, e.g. Loctite 243, to glue in place. Since the adhesive on the stainless encoder shaft only cures very slowly (typically 8 hours), we recommend that the activator Loctite 7649 be used.

Beware of damage!

Generally Applicable Notes

Using the torque support for the motor feedback system, the housing must be correctly seated in the customer's flange arrangement.

The more precise the centring for the motor feedback system, the less the angle and shaft offset during assembly and the less load on the bearing of the motor feedback system. In order not to deform the coupling during assembly (for standalone devices only), always flange mount the motor feedback system first and then fix the coupling on the drive shaft.
For standalone motor feedback systems with a connector exit, the connector housing is connected to the device housing so as to be electrically conductive while, for devices with cable exit, the screening and the braided screen, resp., will be connected to the device housing.
EMC considerations make it mandatory to connect the device housing and the cable screen, resp., to earth. This may be effected via the housing of the mating connector and by connecting the braided screen of the cable, resp. The braided screen should be connected over a large area.

To ensure trouble-free operation, it is imperative to ensure a clean screen connection on both sides.

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Motor Feedback Systems SinCos*

SCS60, SCM60
SCS70, SCM70
SCS70 Standalone
SCM70 Standalone

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Motor Feedback System with Plug-in Shaft and Rubber Support (Fig. 1)

Assembly

Block customer's drive shaft to prevent rotation.
Screw pressing tool onto the B-side encoder shaft end (1).
Spray activator onto the encoder shaft (2) and into the hole of the drive shaft (3).
Thinly apply adhesive onto the encoder shaft (2). Plug encoder shaft (2) in drive shaft (3) and continuously press, with the pressing tool, up to the stop (4). **Do not hit with a hammer or similar tool!!!**

Pressing force required = 250 N – 500 N

Remove pressing tool.
Press housing collar (5) into customer's housing groove (6).
Press housing cover (7) into the rubber housing and fix with screws (8). If the cover can only be pressed in with difficulty, the housing collar (5) can be lightly greased (use high temperature grease 160 °C).
Insert connector (9) volt-free.
Make screen connection (10).

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Only test encoder function after the adhesive is fully cured (8 hours approx.) and, at this time, do not make any mechanical adjustments such as commutation.

Disassembly

Block customer's drive shaft to prevent rotation.
Undo electrical connection (9+10), volt-free. Remove cover (7) by undoing the screws (8). Attach the removal tool to the B-side encoder shaft end (1) and pull the encoder off.

Motor Feedback System with Tapered Shaft and Rubber Support (Fig. 2)

Assembly

Block customer's drive shaft to prevent rotation.
Carefully push encoder (1) onto the drive shaft.
Mount M4 screw (2) and washer (3), and tighten.
Tightening torque: 3.1 Nm.

Press housing collar (4) into customer's housing groove (5).
Should a screw other than the Tuf Lok coated screw (supplied) be used, apply liquid thread locking compound to the area where the screw thread starts.
Press housing cover (6) into the rubber housing and fix with screws (7).
If the housing cover (6) can only be pressed in with difficulty, the housing collar (4) can be lightly greased (use high temperature grease 160 °C).
Insert connector (8) volt-free and connect set of strands (volt-free), resp.
Make screen connection (9).

Disassembly

Block customer's drive shaft to prevent rotation.
Undo electrical connection (8+9), volt-free. Remove the cover (6) by undoing the screws (7). Undo and remove M4 screw (2).
By turning the hexagonal part (11) of the encoder shaft (AF 6 and AF 5.5, resp.), the taper in the motor shaft can be loosened and the device removed.

Motor Feedback System (inbuilt version) – Fitting with Tapered Shaft (Fig. 3)

Assembly

Block customer's drive shaft to prevent rotation.
Carefully push encoder (1) onto the drive shaft. Should there be a driving pin (9) on the drive shaft, it must be ensured that that this is correctly located in the groove (2) of the encoder shaft. This driving pin (9) must not lie against the end of the groove; otherwise there could be runout problems as well as damage to the encoder.
Mount M5 screw (3) and washer (max. Ø 9 mm) (4), and tighten.

Tightening torque: 4.9 Nm.

Should a screw other than the Tuf Lok coated screw (supplied) be used, apply liquid thread locking compound to the area where the screw thread starts.
Rotate encoder (1) according to the connector position required.
Fix torque support (5) with M3 screws (7) and washers (6).
Prevent screws from working loose.
Engage insulator (8) in the matching connector flange.
Make electrical connections (8), volt-free.

Disassembly

Block customer's drive shaft to prevent rotation.
Undo electrical connection (8), volt-free. Undo and remove the M3 screws (7) of the torque support (5). Undo and remove M5 screw (3).
By screwing an M6 screw into the encoder shaft, the encoder (1) is detached from the drive shaft. Press insulator (8) out of the connector flange.

PIN and wire allocation SCS60/SCM60

PIN	Signal	Cable coulours (Cable outlet)	Description
1	U_s	red	Encoder supply voltage. The operating voltage at the encoder ranges from + 7 V to + 12 V. The recommended supply voltage is + 8 V.
2	GND	blue	Encoder ground connection; galvanically separated from the housing. The voltage relating to GND is + U_s.
3	REFSIN	brown	Process data channel; a static voltage of + 2.5 V, which serves as reference voltage for + SIN.
4	REFCOS	black	Process data channel; a static voltage of + 2.5 V, which serves as reference voltage for + COS.
5	Data +	grey	Parameter channel; positive data signal. The parameter channel is an asynchronous, half-duplex interface, which physically corresponds to the EIA RS485 specification. For this, data can be requested from the encoder through different commands; this also makes it possible to write user-specific data such as position offset to the EEPROM of the encoder.
6	Data –	green	Parameter channel; negative data signal. The parameter channel is an asynchronous, half-duplex interface, which physically corresponds to the EIA RS485 specification. For this, data can be requested from the encoder through different commands; this also makes it possible to write user-specific data such as position offset to the EEPROM of the encoder.
7	+ SIN	white	Process data channel; + SIN is a sine signal of 1 V_{pp} with a static offset of REFSIN.
8	+ COS	pink	Process data channel; + COS is a cosine signal of 1 V_{pp} with a static offset of REFCOS.

Connect the she screen strand to the encoder housing!!!

PIN and wire allocation

PIN	Signal	Cable c
1	REFCOS	black
2	Data +	grey
3	N. C.	–
4	N. C.	–
5	+ SIN	white
6	REFSIN	brown
7	Data –	green
8	+ COS	pink
9	N. C./screen[1]	transp
10	GND	blue
11	N. C.	–
12	U_s	red
Plug housing	Screen	–

PINs and cable colours not lis
* Cable outlet [1] only

Motor Feedback System (inbuilt version) – Fitting with Hollow Shaft (Fig. 4)

Assembly

Block customer's drive shaft to prevent rotation.
Carefully push encoder (1) onto the drive shaft. Should there be a driving pin (9) on the drive shaft, it must be ensured that that this is correctly located in the groove (2) of the encoder shaft. This driving pin must not lie against the end of the groove; otherwise there could be runout problems as well as damage to the encoder.
Mount M5 screw (4) and washer (max. Ø 12 mm) (3), and tighten.
Tightening torque: 4.9 Nm.

Should a screw other than the Tuf Lok coated screw (supplied) be used, apply liquid thread locking compound to the area where the screw thread starts.
Rotate encoder (1) according to the connector position required.
Fix torque support (5) with M3 screws (7) and washers (6).
Prevent screws from working loose.
Engage insulator (8) in the matching connector flange.
Make electrical connections (8), volt-free.

Disassembly

Block customer's drive shaft to prevent rotation.
Undo electrical connections (8), volt-free. Undo and remove the M3 screws (7) of the torque support (5). Undo and remove M5 screw (4). Remove the encoder (1).

Motor Feedback System – Fitting with Tapered Shaft (Fig. 5)

Assembly

Block customer's drive shaft to prevent rotation.
Carefully push encoder (1) onto the motor shaft. Should there be a driving pin (9) on the drive shaft, it must be ensured that that this is correctly located in the groove (2) of the encoder shaft. This driving pin must not lie against the end of the groove; otherwise there could be runout problems as well as damage to the encoder.
Mount M5 screw (3) and washer (max. Ø 9 mm) (4), and tighten.

Tightening torque: 4.9 Nm.

Should a screw other than the Tuf Lok coated screw (supplied) be used, apply liquid thread locking compound to the area where the screw thread starts.
Rotate encoder (1) according to the connector position required.
Fix the encoder (1) with M4 screws (5) and washer (6).
Tightening torque: 3.1 Nm.

Prevent screws from working loose.
Twist capping plug (7) into the housing.
Make electrical connections (8), volt-free.

Disassembly

Block customer's drive shaft to prevent rotation.
Undo electrical connections (8), volt-free. Remove capping plug (7) by twisting.
Undo and remove the M4 screws (5) of the encoder (1). Undo and remove M5 screw (3).
By screwing an M6 screw into the encoder shaft, the encoder (1) is detached from the drive shaft. Press insulator (8) out of the connector flange.

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Motor Feedback System – Fitting with Hollow Shaft (Fig. 6)

Assembly

Block customer's drive shaft to prevent rotation.
Carefully push encoder (1) onto the drive shaft. Should there be a driving pin (9) on the drive shaft, it must be ensured that that this is correctly located in the groove (2) of the encoder shaft. This driving pin must not lie against the end of the groove; otherwise there could be runout problems as well as damage to the encoder.
Mount M5 screw (4) and washer (max. Δ 12 mm) (3), and tighten.
Tightening torque: 4.9 Nm.

Should a screw other than the Tuf Lok coated screw (supplied) be used, apply liquid thread locking compound to the area where the screw thread starts.
Rotate encoder (1) according to the connector position required.
Fix encoder (1) with M4 screws (4) and washer (3).
Tightening torque: 3.1 Nm.

Prevent screws from working loose.
Twist capping plug (7) into the housing.
Make electrical connections (8), volt-free.

Disassembly

Block customer's drive shaft to prevent rotation.
Undo electrical connections (8), volt-free. Remove capping plug (7) by twisting.
Undo and remove the M4 screws (4) of the encoder (1). Undo and remove M5 screw (4).
Remove the encoder (1).

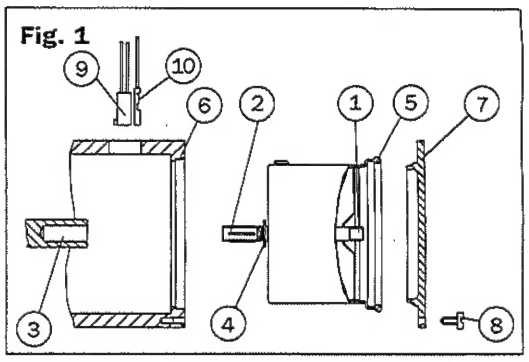
Motor Feedback System with Servo Flange (Standalone) (Fig. 7)

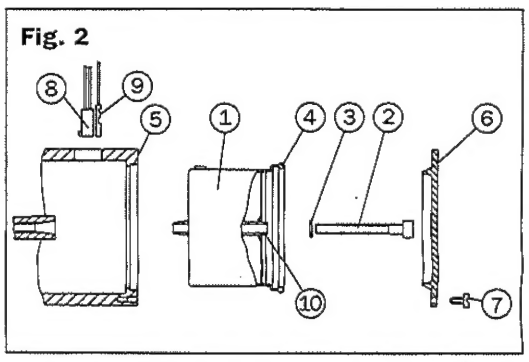
Assembly

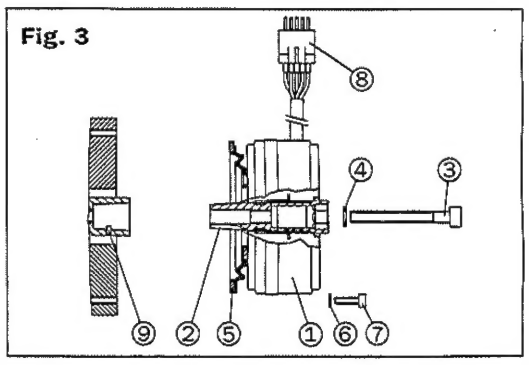
Block customer's drive shaft to prevent rotation.
Mount coupling (1) on the encoder (2). Ensure that the coupling (1) does not brush against the encoder flange (6). Push encoder (2) with mounted coupling (1) onto drive shaft and centring neck. Mount servo clamps (3) with M4 screws (4). Tighten M4 screws (4) only lightly, such that the encoder (2) can still be turned. Determine the connector position by rotating the housing. Fully tighten to prevent M4 screws (4) from working loose. Fix coupling (1) on the drive shaft. Make electrical connection (5), volt-free.

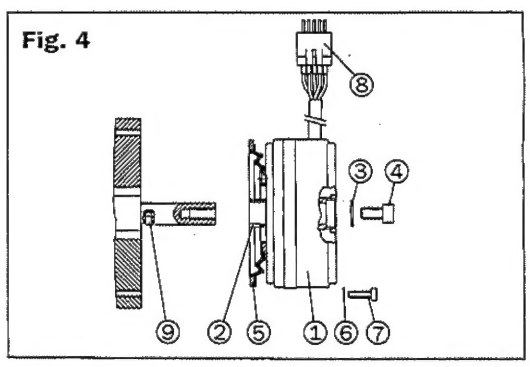
Disassembly

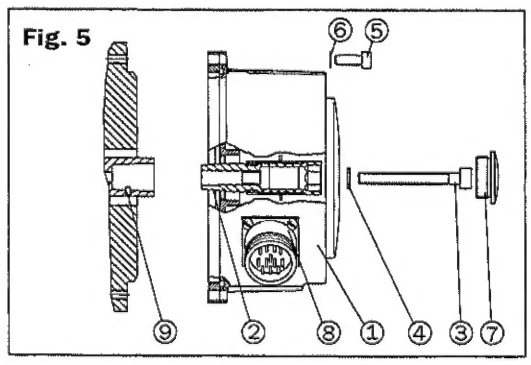
Block customer's drive shaft to prevent rotation.
Undo electrical connection (5) volt-free. Loosen coupling (1) on the drive shaft. Remove servo clamps (3) by undoing the M4 screws (4). Remove encoder (2).

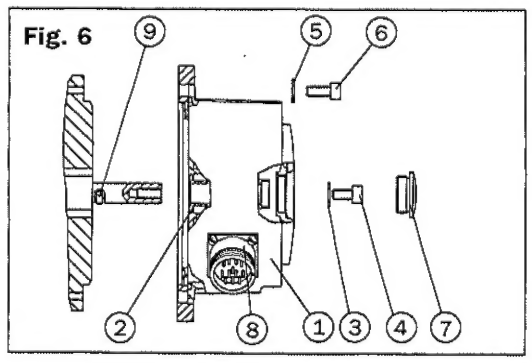


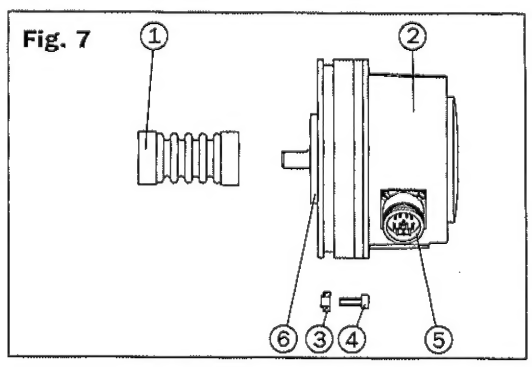












SCS70/SCM70/SCS70 Standalone/SCM70 Standalone

oulours *	Description
	Process data channel; a static voltage of + 2.5 V, which serves as reference voltage for + COS.
	Parameter channel; positive data signal. The parameter channel is an asynchronous, half-duplex interface, which physically corresponds to the EIA RS485 specification. For this, data can be requested from the encoder through different commands; this also makes it possible to write user-specific data such as position offset to the EEPROM of the encoder.
	Process data channel; + SIN is a sine signal of 1 V_{pp} with a static offset of REFSIN.
	Process data channel; a static voltage of + 2.5 V, which serves as reference voltage for + SIN.
	Parameter channel; negative data signal. The parameter channel is an asynchronous, half-duplex interface, which physically corresponds to the EIA RS485 specification. For this, data can be requested from the encoder through different commands; this also makes it possible to write user-specific data such as position offset to the EEPROM of the encoder.
	Process data channel; + COS is a cosine signal of 1 V_{pp} with a static offset of REFCOS.
arent	
	Encoder ground connection; galvanically separated from the housing. The voltage relating to GND is + U_s.
	Encoder supply voltage. The operating voltage at the encoder ranges from +7 V to + 12 V. The recommended supply voltage is + 8 V.

ed, must not be connected. **N. C. = not connected**
or SCS/SCM inbuilt versions